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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/045,507

03/20/1998

DONALD MALCOLM MACINTYRE

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10/12/2004

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EXAMINER

WILLE, DOUGLAS A

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 10/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/045,507

Applicant(s)

MACINTYRE, DONALD MALCOLM

Examiner

Douglas A Wille

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 86-94 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 86-94 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/20/98 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 86 - 90, 93 and 94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarishi et al. in view of Lin, Tsukamoto and Kata et al.

3. With respect to claim 86, 93 and 94, Igarishi et al. show (see Figures 3 and 4 and column 8 line 66 et seq.) a semiconductor 1, with bond pads, a prefabricated sheet 24 which is approximately the same size as 1 with holes, a solder ball bond pad 23 with solder balls (Figure 4), an adhesive material 3 (column 9, line 58) and there is an electrical connection between the solder ball and the die bond pad. Igarishi et al. show a CSP and the material of the layer 24 as being polyimide (column 13, line 60). Lin shows a similar device which uses an interposer where the interposer should match the coefficient of expansion of the die (column 6, line 28) and Tsukamoto shows a similar structure where the plate is glass ceramic which will match the CTE of the die. Kata et al. show that a similar structure can be formed with wafer scale packaging techniques and the wafer can be divided after completion. It would have been obvious to use the Tsukamoto material in the Igarishi et al. device for the reason shown by Lin and to use the wafer scale technique of Kata et al. to gain the cost advantages of wafer scale processing.

4. With respect to claim 87, the interposer matches the CTE of the die.

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5. With respect to claim 88, Lin shows the die can be silicon (column 6, line 32) and it would be obvious to use this material since it is known to be useful.

6. With respect to claim 89, Kata et al. show a similar structure with interconnect 60 which is aluminum (cover Figure and column 6, line 60). It would have been obvious to use the material shown by Kata et al. since it is known to be functional.

7. With respect to claim 90, the upper part of layer 62 is Au (column 7, line 34).

8. Claim 91 is rejected under 35 U.S.C. 103(a) as being unpatentable over Igarishi et al. in view of Lin, Tsukamoto and Kata et al. and further in view of Pasch.

9. Pasch shows an interposer (Figure 6) where the via is filled with a conductive polymer (column 12, line 60) and describes advantages (column 4, line 1 et seq.). It would have been obvious to use the conductive polymer in the basic device for the advantages shown.

10. Claim 92 is rejected under 35 U.S.C. 103(a) as being unpatentable over Igarishi et al. in view of Lin, Tsukamoto and Kata et al. and further in view of Knapp et al.

11. Knapp et al. show the use of a solder mask 23 which is patterned to expose the solder pads for the positioning of solder balls (column 3, line 65). It would have been obvious to use the solder mask shown by Knapp et al. to facilitate the positioning of the solder balls.

Response to Arguments

12. Applicant's arguments are addressed to the amended claims which are addressed above.

Conclusion

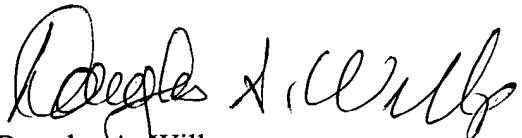
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A Wille whose telephone number is (571) 272-1721.

The examiner can normally be reached on M-F (6:15-2:45).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Douglas A. Wille
Patent Examiner

October 5, 2004